

TRANSDUCTIONS OF "FLA" AND "H" FACTORS FROM SINGLE PHASE CULTURES OF
SAL. ABONY (SW803 Fla⁺ b:enx) TO SAL. TYPHIMURIUM (SW1157 Fla⁻
i:1,2).

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In the earlier report on "the effect of phase difference on the H-antigen transduction in Salmonella", Sal. abony SW803 Fla⁺ phase-1 (or phase-2) ---x Sal. heidelberg SW1092 Fla⁻ phase-1 (or phase-2) was performed. The result has shown that H₁ is transduced simultaneously with Fla₁₀₉₂ in certain frequencies and the phase of transduction is exclusively determined by the phase of recipient. These results has led to the introduction of "H₂-epistatic, unstable hypothesis".

The present report deals with the similar experiment used Sal. typhimurium TM2 Fla⁻ mutant SW1157 (-- Fla⁻-5 in the previous report) as a recipient. The experiment was planned in order to confirm the previous result and to test its generality. At the same time, frequencies of linked transduction were compared.

MATERIALS AND METHODS.

SW1092 are Fla⁻ mutant obtained by ultra-violet treatment of Sal. typhimurium TM2. As reported in the previous report, Fla factor correspond to Fla⁻ locus of SW1092 (designated tentatively as Fla₁₀₉₂) is transduced linked with H₁ in certain frequency but not with H₂. Fla₁₁₅₇ belongs different loci from Fla₆₆₆ and Fla₁₀₉₂, which also have been found out to be transduced linked with H₁ and have been used in the previous experiments.

The method of preparation of single phase cultures or lysates and the procedure of transduction experiment are the same as the previous experiment.

RESULTS AND DISCUSSION.

The results were summarized in Table 1.

With very few exceptions, which may be explained by phase variation during the course of experiment, following articles, observed in the previous experiment, are confirmed in the present experiment.

- 1). The difference of donor phase gives no different result.
- 2). The phase of the transformed cell is the same with the phase of the recipient.
- 3). H_1 is transduced linked with Fla in certain frequencies regardless the phase of donor or recipient, whereas H_2 is not transduced linked to Fla.

The ratio of linked transduction (RLT) range from 0.09 to 0.28. However, χ^2 -test calculated from the Brandt and Snedecor's formula shows P-value $0.3 < P < 0.5$. This means the difference of RLT between different phase combinations are not regarded as significant, contrary with the result of the previous experiment. There is clear difference between the present experiment and the previous on RLT: the ratio of H_1 -linked transduction in SW1157 is about one fourth of the case of SW1092. Whether these difference of frequencies represents the relationships of local distance or not is still uncertain. In order to get more clear sight on the local relationships, following experiments may be helpful:

$$\begin{array}{l} \text{SW1092}(\text{Fla}^-_{1092} H_1^r) \text{ ---x } \text{SW1157}(\text{Fla}^-_{1157} H_1^i) \\ \text{Fla}^+ \text{--- SW1092}(\text{Fla}^+_{1092} H_1^r) \text{ ---x } " \\ \text{SW1157}(\text{Fla}^-_{1157} H_1^i) \text{ ---x } \text{SW1092}(\text{Fla}^-_{1092} H_1^r) \\ \text{TM2 } (\text{Fla}^+ H_1^i) \text{ ---x } " \end{array}$$

Select Fla^+ on MGA-plates and compare RLT between Fla and H_1 .

may be worth it
but maybe should
repeat from expt 1

Table 1.

Transductions of Fla and H factors from single phase cultures of Sal. abony (SW803 Fla⁺ b:enx) to Sal. typhimurium (SW1157 Fla⁻ i:1,2). Fla₁₁₅₇ was used as selective marker.

Phase of donor	Phase of recipient	H-antigen types of Fla-transduction cells							Ratio of linked transduction
		Unlinked type			Linked type			Total	
		1(1,2)	(i)1,2	Total	b(1,2)	(b)1,2	Total		
1. <u>b</u>	1. <u>i</u>	21	0	21	2	0	2	23	0.09
1. <u>b</u>	2. <u>1,2</u>	3	30	33	0	7	7	40	0.18
2. <u>enx</u>	1. <u>i</u>	13	0	13	5	0	5	18	0.28
2. <u>enx</u>	2. <u>1,2</u>	1	23	24	0	4	4	28	0.14
Total		38	53	91	7	11	18	109	0.17

APPENDIX.

Test of homogeneity of the frequency of linked transduction of H₁ to Fla₁₁₅₇.

$\chi^2 = 2.42$ calculated from the Brandt and Snedecar's formula.

$n = 3, 0.3 < P < 0.5$

donor 9:9 to some more of #1.
recip.